

(19) World Intellectual Property  
Organization  
International Bureau



(43) International Publication Date  
4 November 2004 (04.11.2004)

PCT

(10) International Publication Number  
**WO 2004/095771 A1**

(51) International Patent Classification<sup>7</sup>: **H04L 9/30**

(21) International Application Number:  
PCT/JP2004/005528

(22) International Filing Date: 14 April 2004 (14.04.2004)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:  
2003-119973 24 April 2003 (24.04.2003) JP

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(81) Designated States (unless otherwise indicated, for every  
kind of national protection available): AE, AG, AL, AM,  
AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN,  
CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI,  
GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, KE, KG,  
KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG,  
MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH,  
PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN,  
TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every  
kind of regional protection available): ARIPO (BW, GH,  
GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW),  
Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), Euro-  
pean (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR,  
GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK,  
TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW,  
ML, MR, NE, SN, TD, TG).

Published:

— with international search report

[Continued on next page]

(54) Title: PARAMETER GENERATION APPARATUS, ENCRYPTION SYSTEM, DECRYPTION SYSTEM, ENCRYPTION APPARATUS, DECRYPTION APPARATUS, ENCRYPTION METHOD, DECRYPTION METHOD, AND PROGRAM THEREOF

Formula storage unit	
Lattice constant GL	2.12
Decryption time evaluation formula EF	$\log(T)=0.04N-6.2$
Lattice constant GL	3.5
Decryption time evaluation formula EF	$\log(T)=0.08N-4.8$
Lattice constant GL	4.6
Decryption time evaluation formula EF	$\log(T)=0.13N-4.4$
Conditional expression ED	$6d+2df-1 < q/2$
Initial security determination formula IF	$\log(T)=0.2002N-18.884$

(57) Abstract: A parameter generation apparatus for generating parameters causing no decryption error for an NTRU cryptosystem so that an encrypted communication can be carried out between an encryption apparatus and a decryption apparatus in a secure and reliable manner, is comprised of: a provisional parameter generation unit operable to generate a set of provisional parameters that do not cause any decryption errors, based on error condition information that is provided in advance, said error condition information indicating a condition for causing no decryption error; and an output parameter generation unit operable to generate an output parameter that does not cause any decryption errors, using said set of provisional parameters, based on a lattice constant that is calculated from said set of provisional parameters.

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